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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/742,301	12/18/2003	Glenn H. McGall	3402.1	5674

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EXAMINER

WILDER, CYNTHIA B

ART UNIT PAPER NUMBER

1637

DATE MAILED: 06/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/742,301	<b>Applicant(s)</b> MCGALL, GLENN H.	
	<b>Examiner</b> Cynthia B. Wilder, Ph.D.	<b>Art Unit</b> 1637	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 15 October 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>6/2005</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Objections***

1. Claim 8 is objected to because of the following informalities:
  - (a) The word "phor~~ph~~oramidite" is misspelled. It is suggested amending the claim to recite "phosphoramidite".
  - (b) Claim 7 does not have a (.) at the end of the sentence.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 9, 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
  - (a) Claims 9 and 10 are indefinite at the recitation of the abbreviations "NVOC", "NPOC", "MeNVOC" and "MeNPOC". While some abbreviation have standard meaning, abbreviations often have more than one meaning in the art. Therefore, it is suggested asserting the full name of the abbreviation in to the claim.

### ***Claim Rejections - 35 USC § 102(b)***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

5. Claims 1-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Huang et al (US 2001/0044530 A1, publication date November 22, 2001). Regarding claim 1, Huang et al teach a method for preparing a high density oligonucleotide array on a solid support, said method comprising the following steps; (a) preparing a solid support having a surface comprising functional groups; (b) attaching an activated nucleotide to said functional group in the presence of an activator; (c) repeating said step of attaching an activator nucleotide to form an oligonucleotide array having at least 100 different oligonucleotides/cm<sup>2</sup> (paragraphs 006-007, 0015, 0018, 0028, 0029, 0046, 0053-0062).

Regarding claims 2-5, Huang et al teach a method for preparing a high density oligonucleotide array according to claim 1, wherein said array has at least 500, or at least 1000 or at least 5000 or at least 10,000 different oligonucleotides/cm<sup>2</sup> (0062).

Regarding claim 6, Huang et al teach a method according to claim 1, wherein said activated nucleotide is a phosphoramidite (0006).

Regarding claim 7, Huang et al teach a method according to claim 6, wherein said phosphoramidite is located at the 3' hydroxyl group of a nucleotide (006 and 0048).

Regarding claim 8, Huang et al teach a method according to claim 6, wherein said phosphoramidite further comprises a photo-protecting group (007 and 0050).

Regarding claims 9 and 10, Huang et al teach a method according to claim 8, wherein said photo protecting group is selected from the group consisting of NVOC or MeNPOC (0050).

Regarding claim 11, Huang et al teach a method according to claim 1, wherein said activator is a tetrazole (0046). Therefore, Huang et al meet the limitation of the claims recited above.

***Claim Rejections - 35 USC § 102(e)***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1-6, 11-13 and 15 are rejected under 35 U.S.C. 102(e) as being anticipated by Brennan et al (US 6,632,641 B1, effective filing date October 1999). Regarding claim 1, , Brennan et al teach a method for preparing a high density oligonucleotide array on a solid support, said method comprising the following steps; (a) preparing a solid support having a surface comprising functional groups; (b) attaching an activated nucleotide to said functional group in the presence of an activator; (c) repeating said step of attaching an activator nucleotide to form an oligonucleotide array having at least 100 different oligonucleotides/cm<sup>2</sup> (col. 4, lines 18-25 and col. 11, lines 6-32; especially Example 4 and Example 6).

Regarding claims 2-5, Brennan et al teach a method for preparing a high density oligonucleotide array according to claim 1, wherein said array has at least 500, or at least 1000 or at least 5000 or at least 10,000 different oligonucleotides/cm<sup>2</sup> (col. 4, lines 18-25 and col. 11, lines 6-32).

Regarding claim 6, Brennan et al teach a method according to claim 1, wherein said activated nucleotide is a phosphoramidite (Example 4 and 6).

Regarding claims 11-13, Brennan et al teach a method according to claim 1, wherein said activator is ethylthiotetrazole (example 4 and 6).

Regarding claim 15, Brennan et al teach a method for preparing a high density oligonucleotide array on a solid support, said method comprising providing a solid support (chip) having a surface comprising a functional group, attaching a phosphoramidite nucleotide to said functional group in the presence of ethylthiotetrazole; repeating said steps to produce an oligonucleotide array having at least 100 different oligonucleotides/cm<sup>2</sup> (Examples 4 and 6). Therefore, Brennan meets the limitations of claims 1-6, 11-13 and 15 of the instant invention.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Huang et al as previously applied above in view of (Eleuteri et al. Organic Process Research and Development, Vol. 4, pages 182-189, 2000). Regarding claim 14, Huang et al teach a method for preparing a high density Oligonucleotide array on a solid support, said method comprising steps of (a) preparing a solid support having a surface comprising functional groups; (b) attaching an activated nucleotide to said functional group in the presence of an activator, wherein said activator is tetrazole; (c) repeating said step of attaching an activator nucleotide to form an oligonucleotide array having at least 100 different oligonucleotides/cm<sup>2</sup>.

Huang et al differs from the instant invention in that the reference does not teach wherein the activator is pyridinium trifluoroacetate.

Eleuteri et al teach coupling phosphoramidites in the presence of the activator, pyridinium trifluoroacetate, to hydroxyl groups during oligonucleotide synthesis to a solid support. Eleuteri et al teach that pyridinium trifluoroacetate is a remarkably efficient replacement for 1H-tetrazole in the solid supported synthesis of oligonucleotides because the reagent is safe, inexpensive and is not moisture sensitive. Eleuteri additionally teach that pyridinium trifluoroacetate is soluble in acetonitrile which is an added advantage (see abstract and entire reference).

Therefore, one of ordinary skill in the art at the time of the claimed invention would have been motivated to have modified the method of preparing an oligonucleotide array to encompass the activator pyridinium trifluoroacetate instead of tetrazole with a reasonable expectation of success based on the benefits taught by Eleuteri that pyridinium trifluoroacetate is a remarkably efficient replacement for 1H-tetrazole because the reagent is safe, inexpensive and is soluble in

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acetonitrile. It would have been *prima facie* obvious to one of ordinary skill in the art at the time of the claimed invention to utilize pyridinium trifluoroacetate rather than tetrazole in the oligonucleotide array synthesis method based on its efficiency, cost effectiveness and environmentally safe features as taught by Eleuteri (see "results and discussion").

***Prior Art***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Perbost et al (US 2002/0086327 A1, July 4, 2002) teach method steps for preparing high-density array by attaching an activated nucleotide to a functional group on a solid support surface in the presence of an activator.

Sundberg et al (US 5,919,523) teach method steps for preparing high-density array by attaching an activated nucleotide to a functional group on a solid support surface in the presence of an activator.

Nelson (US 2003/0181712 A1, September 2003) teaches method steps for preparing high-density array by attaching an activated nucleotide to a functional group on a solid support surface in the presence of an activator.

***Conclusion***

11. No claims are allowed. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia B. Wilder, Ph.D. whose telephone number is (571) 272-0791. The examiner works a flexible schedule and can be reached by phone and voice mail. Alternatively, a request for a return telephone call may be emailed to [cynthia.wilder@uspto.gov](mailto:cynthia.wilder@uspto.gov). Since email communications may not be secure, it is suggested that



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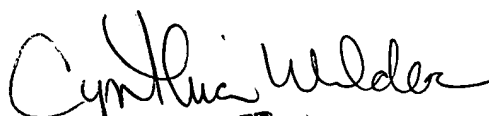
information in such request be limited to name, phone number, and the best time to return the call.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached on (571) 272-0782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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CYNTHIA WILDER  
PATENT EXAMINER  
6/24/2006